Sky and TELESCOPE

INDEX to Volume 45

January to June, 1973

Titles

Amateurs View Apollo Launch, *Paul A. Valleli,* 150
Another Jupiter Pioneer, *Raymond N. Watts, Jr.,* 346
Apollo Missions in Retrospect, The, 3
Astronomy Education — New Strategies, *Frank Six, Tony Wawrukiewicz, Paul Campbell,* and *Richard Hackney,* 286
Astronomy in New Mexico, *William L. Reitmeyer,* 19
Astronomy Through the Skylab Scientific Airlocks, *Karl G. Henize* and *J. L. Weinberg,* 272
AURA's Fabry-Pérot Interferometer, *Malcolm G. Smith,* 208
Brazilian Radio Telescope for Millimeter Wavelengths, A, *Pierre Kaufmann* and *Richard D'Amato,* 144
Constellation Postcards and Slides, 368
Copernicana, 71
Copernicus' Place in the History of Astronomy, *Edward Rosen,* 72
Creation of the Universe, The, *Wasley S. Krogdahl,* 140
Distribution of X-Ray Sources in Our Galaxy, The, *Frederick D. Seward,* 220
Early Evolution of Stars, The, *S. E. Strom* and *K. M. Strom,* I, 279; II, 359
Events of 1973 in the Graphic Time Table, 33
First New Comet of 1973, The, *F. Dossin* and *A. Heck,* 291
Gamma Rays from NP 0532, 155
Gegenschein Observations from Pioneer 10, *M. S. Hanner* and *J. L. Weinberg,* 217
Great Eclipse of 1878, The, *John A. Eddy,* 340
Ira S. Bowen (1898-1973), *O. C. Wilson,* 212
Molecules and Evolution in the Galaxy, *David Buhl,* 156
Mutual Phenomena of Jupiter's Satellites in 1973-74, *R. T. Brinkmann* and *R. L. Millis,* 93
NASA Programs Are Cut, 139
Notes on the Fourth Lunar Science Conference — I, *Thornton L. Page,* 355
Orange Soil and Other Apollo 17 Results, *Raymond N. Watts, Jr.,* 146
OSO-7 Year of Discovery, The, *Stephen P. Maran* and *Roger J. Thomas,* 4
Photographic Report from Kitt Peak, 10
Problems of Lunar Motions and Mapping, *J. Derral Mulholland,* 283
Progress Report on Skylab, *Raymond N. Watts, Jr.,* 24
Pursuing the Lunar Shadow, *Arthur N. Cox,* 88
Results from the Utrecht Orbiting Spectrophotometer, *T. M. Kamperman, K. A. van der Hucht, H. J. Lamers,* and *R. Hoekstra,* 85
Solar Eclipse: June 30, 1973, 161
Solar Observers To Cooperate with Skylab, *Raymond N. Watts, Jr.,* 295
South Africa's Newest Observatory, *R. P. Olowin,* 347
Swift as the Moon's Shadow, *D. H. Liebenberg* and *M. M. Hoffman,* 351
Two Puzzling Objects: OJ 287 and BL Lacertae, *M. A. Stull,* 224
Using an Image Intensifier at a College Observatory, *Michael A. Seeds* and *Anthony J. Distasio,* 76
Visit to Taurus-Littrow, *Roger W. Sinnott,* 79

Authors

Abt, Helmut A., letter, 271
Aksnes, Kaare, letter, 271
Allen, Walter C., An Observatory Built as a Retirement Project, 51
Apeldoorn, Ben C. J., Perseid Observations by Dutch and Belgian Amateurs, 228
Ashbrook, Joseph, Algol Observations, 131
Astronomical Scrapbook, 90, 152, 292
Variable Star Observers Meet in Connecticut, 297
Bally, John, A September Conference of Amateurs at Oakland, 27
Bartky, C. D., E. Gordon, and *F. Li,* letter, 219
Bergmann, Peter, book review, 108
Botley, Cicely M., letter, 219
Bowen, Charles W., Jr., A Motor-Driven Eyepiece Focuser, 120
Brinkmann, R. T., and *R. L. Millis,* Mutual Phenomena of Jupiter's Satellites in 1973-74, 93
Buhl, David, Molecules and Evolution in the Galaxy, 156
C. A. F., see *Federer, Charles A., Jr.*
Cameron, G. Harvey, letter, 339
Campbell, Paul, see *Six, Frank*
Carleton, N. P., book review, 385
Carr, John M., book review, 112
Chapman, Clark R., book review, 179
Chartrand, Mark R., III, book review, 380
Colgate, Stirling A., book review, 110
Cox, Arthur N., Pursuing the Lunar Shadow, 88
Cox, Robert E., Arc Lamp for Optical Testing, An, 183
book review, 44
conductor, Gleanings for ATM's, 51, 116, 183, 250, 315, 389
Light-Emitting Diodes for Telescope Illumination, 319
D'Amato, Richard, see *Kaufmann, Pierre*
Davis, D. J., Jr., see *Mullen, E. G.*
Delsemme, A. H., book review, 308
de Villiers, C. W., A South African Amateur's Radio Telescopes, 363
Dickinson, Terence, book review, 45
Distasio, Anthony J., see *Seeds, Michael A.*
Dossin, F., and *A. Heck,* The First New Comet of 1973, 291
Dunham, David W., May Occultation of Vesta by the Moon, A, 261
Occultation Highlights for the Year 1973, 62
Occultation of Venus for Hawaii, 332
East, George, Use of a Vignetting Disk, 322
Eddy, John A., The Great Eclipse of 1878, 340
Ernest, Orien, Deep-Sky Photography with Cooled Emulsions, 189
Federer, Charles A., Jr., book review, 244
Garstang, R. H., book review, 181
Gasteyer, Charles, book review, 307
Gavin, Maurice V., letter, 219
Gbur, Nicholas J., Observing the Satellites of Saturn, 199
Gordon, E., see *Bartky, C. D.*
Hackney, Richard, see *Six, Frank*
Hanner, M. S., and *J. L. Weinberg,* Gegenschein Observations from Pioneer 10, 217
Heck, A., see *Dossin, F.*
Hendl, Richard G., book review, 379
Henize, Karl G., and *J. L. Weinberg,* Astronomy Through the Skylab Scientific Airlocks, 272
Hoekstra, R., see *Kamperman, T. M.*
Hoffman, M. M., see *Liebenberg, D. H.*
Houston, Walter Scott, Deep-Sky Wonders, 60, 129, 196, 260, 329 (correction, 346)
Hynek, J. Allen, book review, 175
Irwin, John B., book review, 247
J. A., see *Ashbrook, Joseph*
Jones, Edward L., A Dual-Power Cassegrain with a Relay Lens, 116
Kamperman, T. M., K. A. van der Hucht, H. J. Lamers, and *R. Hoekstra,* Results from the Utrecht Orbiting Spectrophotometer, 85
Kaufmann, Pierre, and *Richard D'Amato,* A Brazilian Radio Telescope for Millimeter Wavelengths, 144
Kielkopf, John F., An Easily Constructed Caustic Tester, 315

Krogdahl, Wasley S., The Creation of the Universe, 140
Lamers, H. J., see *Kamperman, T. M.*
Larsen, Lionel E., letter, 219
Leitner, Harry O., A California Amateur's 12½-inch Newtonian-Cassegrain, 389
Li, F., see *Bartky, C. D.*
Liebenberg, D. H. and *M. M. Hoffman*, Swift as the Moon's Shadow, 351
Lovi, George, book review, 42
Rambling Through . . . (current month) Skies, 32, 102, 170, 234, 302, 370
Maag, Russell C., Building a Recorder for Sudden Enhancement of Atmospherics, 392
Mack, Robert, and *Leonard Weinstein*, Printing Eclipse Photographs, 322
Maran, Stephen P., and *Roger J. Thomas*, The OSO-7 Year of Discovery, 4
Marsden, Irving G., book review, 381
McDonald, Lee, Deep-Sky Objects in a 24-inch Reflector, 56
McIntosh, Patrick S., book review, 310
Mihalas, Dimitri, book review, 41
Millis, R. L., see *Brinkmann, R. T.*
Montague, Allen C., A Compact Telescope Shelter, 297
Mulholland, J. Derral, Problems of Lunar Motions and Mapping, 283
Mullen, E. G., and *D. J. Davis, Jr.*, Photometric Observations of Auroras During August, 1972, 130
Norton, O. Richard, Color Infrared Photography of Some Astronomical Objects, 396
Olowin, R. P., South Africa's Newest Observatory, 347
Page, Thornton L., Notes on the Fourth Lunar Science Conference—I, 355
Pierce, David A., book review, 107
R. E. C., see *Cox, Robert E.*
R. W. S., see *Sinnott, Roger W.*
Reitmeyer, William L., Astronomy in New Mexico, 19
Roberts, Morton S., book review, 243
Rosen, Edward, Copernicus' Place in the History of Astronomy, 72
Sato, Takeshi, Japanese Amateurs Visit the Land of Morning Calm, 96
Schatten, Kenneth, book review, 176
Seeds, Michael A., and *Anthony J. Distasio*, Using an Image Intensifier at a College Observatory, 76
Seward, Frederick D., The Distribution of X-Ray Sources in Our Galaxy, 220
Sinnott, Roger W., Extent of the Corona on Photographs, 324
Limiting Magnitudes with Amateur Telescopes, 401
Visit to Taurus-Littrow, 79
Six, Frank, Tony Wawrukiewicz, Paul Campbell, and *Richard Hackney*, Astronomy Education—New Strategies, 286
Smiley, Charles H., letter, 339
Smith, J. Russell, Moving a 16-inch Telescope, 250
Smith, Malcolm G., AURA's Fabry-Pérot Interferometer, 208
Strom, S. E., and *K. M. Strom*, The Early Evolution of Stars—I, 279; II, 359
Stull, M. A., Two Puzzling Objects: OJ 287 and BL Lacertae, 224
Thomas, Roger J., see *Maran, Stephen P.*
Valleli, Paul A., Amateurs View Apollo Launch, 150
van der Hucht, K. A., see *Kamperman, T. M.*
Veverka, J., book review, 178
Victor, Robert C., Sun, Moon, and Planets This Month, 65, 133, 201, 265, 333, 405
Watts, Raymond N., Jr., Another Jupiter Pioneer, 346
Is HEAO Dead? 346
Lunokhod 2 on the Moon, 148
Orange Soil and Other Apollo 17 Results, 146
Pioneer 10's Progress, 26
Progress Report on Skylab, 24
Solar Observers To Cooperate with Skylab, 295
What Happened to Salyut? 346
Wawrukiewicz, Tony, see *Six, Frank*
Weinberg, J. L., see *Hanner, M. S.; Henize, Karl G.*
Weinstein, Leonard, see *Mack, Robert*
Wilson, O. C., Ira S. Bowen (1898-1973), 212
Wolbach, John G., book review, 383

Departments and Features

Amateur Astronomers—
Amateur Activities at Latitude 26° South, 165
Amateur Briefs, 27, 98, 166, 230, 297, 363
Aubrey Hustead Dies, 166
California Amateur Dies, 28
Compact Telescope Shelter, A, 297
Convention News, 364
Japanese Amateurs Visit the Land of Morning Calm, 96
More Tours to the June Solar Eclipse, 97
Ohio Meeting, 297
Perseid Observations by Dutch and Belgian Amateurs, 228
September Conference of Amateurs at Oakland, A, 27
South African Amateur's Radio Telescopes, A, 363
Variable Star Conference, 166
Variable Star Observers Meet in Connecticut, 297
Astronomical Scrapbook—
Adventures of C. H. F. Peters, The, I, 90; II, 152
Johann Bayer and His Star Nomenclature, 292
Books and the Sky—
Astronomy One, J. Allen Hynek and Necia H. Apfel, 107
Atmospheres, Richard M. Goody and James C. G. Walker, 379
Boundaries of the Universe, John S. Glasby, 112
Catadioptric Imaging Systems, Jonathan Maxwell, 44
City of the Stargazers, Kenneth Heuer, 244
Emerging Universe, The, William C. Saslaw and Kenneth C. Jacobs, editors, 247
External Galaxies and Quasi-Stellar Objects, David S. Evans, editor, 243
Gravitation and Cosmology, Steven Weinberg, 108
Laboratory Exercises for General Astronomy, Linda Kelsey, Darrel Hoff, and John Neff, 381
Legacy of George Ellery Hale, The, Helen Wright, Joan N. Warnow, and Charles Weiner, editors, 307
Man and His Universe, Zdenek Kopal, 45
Moons and Planets, William K. Hartmann, 178
Motion, Evolution of Orbits, and Origin of Comets, The, G. A. Chebotarev, E. I. Kazimirchak-Polonskaya, and B. G. Marsden, editors, 308
New Astronomies, The, Ben Bova, 380
New Techniques in Astronomy, Hector C. Ingrao, editor, 385
Optical Aurora, The, A. Omholt, 181
Physics of Cosmic X-ray, Gamma-ray, and Particle Sources, The, Kenneth Greisen, 110
Physics of the Solar Corona, Constantin J. Macris, editor, 310
Physics of the Solar System, S. I. Rasool, editor, 179
Selected Exercises in Galactic Astronomy, I. Atanasijevic, 41
Solar Activity Observations and Predictions, Patrick S. McIntosh and Murray Dryer, editors, 383
Solar Magnetic Fields, Robert Howard, editor, 176
Solar System, The, Frank W. Cousins, 175
Star Myths and Stories, Percy M. Proctor, 42
Celestial Calendar—
Ceres—The Best Minor Planet in 1973, 331
Eclipsing Variable VV Ursae Majoris, The, 262
February Pleiades Occultation Reminder, 132
Jupiter's Satellites, 265, 333, 405
Meteors, 64, 264, 332, 404
Moon Phases and Distances, 64, 133, 200, 263, 332, 404
Minima of Algol, 65, 133, 200, 265, 331, 404
Minor Planet No. 2 Pallas, 263
Observing the Satellites of Saturn, 199
Occultation Highlights for the Year 1973, 62
Occultation of Venus for Hawaii, 332
Occultations of Bright Stars, 132 (correction, 160)
Paths of Uranus and Neptune This Year, 64
Sun, Moon, and Planets This Month, The, 65, 133, 201, 265, 333, 405
Test Objects for Telescope Resolution, 404
Variable Star Maxima, 64, 133, 200, 264, 331, 404
Vesta Reminder, 333
Feature picture—
Eta Carinae nebula, 236
Front-cover photographs—
Eclipse Painting from Thailand, 337
Kitt Peak 4-Meter Telescope, 1
Launch of Apollo 17, 137
Nicholas Copernicus (1473-1543), 69
Objective-Prism Photograph of the Field of Eta Carinae, 205
Skylab Stellar Photometer, 269
Gleanings for ATM's—
Arc Lamp for Optical Testing, An, 183
Building a Recorder for Sudden Enhancement of Atmospherics, 392
California Amateur's 12½-inch Newtonian-Cassegrain, A, 389
Dual-Power Cassegrain with a Relay Lens, A, 116
Easily Constructed Caustic Tester, An, 315
Light-Emitting Diodes for Telescope Illumination, 319
Motor-Driven Eyepiece Focuser, A, 120
Moving a 16-inch Telescope, 250
Observatory Built as a Retirement Project, An, 51
In Focus, 207
In the Current Journals, 23, 92, 159, 216, 277, 354
Letters, 219, 271, 339
New Books Received, 47, 113, 182, 248, 312, 386
News Notes—
American Meteor Society Moves, 354
Asteroids 1797 to 1813, 216
Big Australian Schmidt, 159
Bright Comet Next Winter!, A, 277

Calendar Reformer, 214
Canterbury Sky Atlas, 215
Comet Araya, 87
Comet Heck-Sause (1973a), 143
Copernicus Medal, 278
Diameters of Two Red Stars, 91
Diamonds in Impactite, 358
Did a Comet Strike the Moon? 160
Does Planet X Exist? 22
Dutch Stellar Astronomer, 160
Historian of Astronomy, 278
Interstellar Hydrogen Map, 214
Largest Red Shift, 353
Lowell Observatory Leader, 23
Mars Map, 358
Mass of the Moon, 278
Measurer of Star Distances, 23
More About a Nearby Galaxy, 353
More About Stephan's Quintet, 92
Nearby Star, 354
New Findings About Jupiter's and Saturn's Satellites, 22
Nova Carinae 1970, 216
Orange Soil Very Old, 216
Pleione's New Shell, 216
Pluto's Rotation, 277
Polish Comet Expert, 358
Radar Echoes from Saturn, 214
Radioactivity of Aristarchus, 277
Robert C. Cameron, 158
Salute to E. J. Öpik, 278
San Juan Capistrano Meteorite, 354
Sirius Not Triple, 354
Southern Sky Atlas, 346
Spectra of Rapidly Rotating Objects, 226
Strange Star in Aquila, A, 277
Surface Composition of Mercury, 91
Three Astrometric Binaries, 159
Total Eclipses in the 1970's, 23
Unusual Variable in Lacerta, 160
Velocity of Light 300 Years Ago, 353
Very Young Galaxies? 91
Well-Observed Fireball, A, 215

Observer's Page —
Algol Observations, 131
Color Infrared Photography of Some Astronomical Objects, 396
Deep-Sky Objects in a 24-inch Reflector, 56
Deep-Sky Photography with Cooled Emulsions, 189
Deep-Sky Wonders, 60, 129, 196, 260, 329 (correction, 346)
Large and Very Complex Sunspot Group, A, 61
Limiting Magnitudes with Amateur Telescopes, 401
May Occultation of Vesta, A, 261
Observations of the Moon in the Pleiades, 256
Observations of the Quadrantid Meteors in 1973, 327
Observers' Notebook, 403
Photometric Observations of Auroras During August, 1972, 130
Potpourri from the Observers' Notebook, A, 122
Some Hints for Photographers of Total Solar Eclipses, 322
Sunspot Numbers, 61, 131, 195, 259, 328, 400

Rambling Through . . . (current month) Skies, 32, 102, 170, 234, 302, 370
Southern Stars, 39, 173, 305 (correction, 402)
Stars for . . . (current month), 32, 102, 170, 234, 302, 370

Selected Topics and Celestial Objects

This listing is not intended to be exhaustive and does not supplant the other parts of the index. For example, material in such regular features as Books and the Sky is ordinarily indexed only under the Departments and Features section.

Amateur astronomers: AAVSO, 297; American Meteor Society, 354; Curitiba, Brazil, 165; Dutch and Belgian, 228; Japanese, 96; Krugersdorp, South Africa, 165; Oakland, Calif., 27; San Francisco, Calif., 56

Artificial satellites and spacecraft: Apollo 17, 3, 79, 146, 150; HEAO, 139, 346; Luna 21, 148; Lunokhod 2, 148; OSO-7, 4; Pioneer 10, 26, 217; Pioneer 11, 295, 346; Salyut 2, 346; Skylab, 24, 272, 295; Soviet-American cooperation, 295; TD-1A, 85

Asteroids: Nos. 1797-1813, 216; Vesta in Hyades, 125

Astronomy education: 286

Auroras: August, 1972, 130

Clusters: Globular — Omega Centauri, 329 (correction, 346); M3, 260; M15, 78; NGC 1851, 60. Open — M41, 129; M44, 172; M46, 129; M47, 129; M93, 129

Comets: collision with moon? 160; 1972I (Araya), 87; 1973a (Heck-Sause), 143, 291; 1973f (Kohoutek), 277

Constellation study: 32, 102; Aries, 234; Cancer, 170; postcards and slides, 368; Ursa Major, 234

Cosmogony: 140

Double and multiple stars: Albireo, 329; Alcyone double? 125; astrometric binaries, 159; resolution tests, 404; Sirius, 128, 354

Eclipses: long total solar, 339; July 29, 1878, solar, 340; July 10, 1972, solar, 88; June 30, 1973, solar, 97, 161, 302, 351; December 24, 1973, solar, 304; 1974-79 solar, 23

Galaxies: Coma cluster, 140; in Leo, 196; Large Magellanic Cloud, 211; nearby, 353; Stephan's Quintet, 92; very young, 91; M33, 56; M51, 189; M66, 197; M94, 260; M96, 197; M101, 57; Markarian 261-2, 91; NGC 1531-2, 60; NGC 1792, 60; NGC 4565, 59; NGC 4631, 260; NGC 4656, 260

Gamma-ray astronomy: 155

Gegenschein: 217

History: J. Bayer, 292; Copernicus, 71, 72, 278; C. Peters, 90, 152, 271, 339; star nomenclature, 292; J. Tebbutt, 219; velocity of light 300 years ago, 353

Image intensifiers: 76

Interferometers: Fabry-Pérot, 208

Interstellar molecules: 156

Jupiter: frost on satellites, 22; Ganymede occults star, 125; mutual phenomena of satellites, 93, 271; satellite VI, 23

Light, speed of: 353

Mars: map, 358

Mercury: surface composition, 91

Meteorites: diamonds made by impact, 358; San Juan Capistrano, 354

Meteors: across moon, 122; American Meteor Society, 354; August 10, 1972, fireball, 219; Czech fireball, 215; fireball photographs, 122, 123, 219; Geminid, 127; Leonid, 127; Perseid, 228; Quadrantid, 327

Milky Way galaxy: interstellar hydrogen, 214; molecules, 156; X-ray sources, 220

Moon: Apollo 17 results, 146; Aristarchus radioactivity, 277; collision with comet? 160; Le Monnier, 284; Lunar Science Conference, 355; Lunokhod 2, 148; Lyell, 403; mass, 278; motions and mapping, 282; orange soil, 81, 146, 216; Taurus-Littrow visit, 79; young crescent, 403

Nebulae: Diffuse — Eta Carinae, 207, 236; Horsehead, 194; in Taurus, 282; near Rho Ophiuchi, 279; North America, 195, 359; observed with interferometer, 208; 30 Doradus, 211; Veil, 329; M8, 191, 208; M20, 191; M42, 78; NGC 604, 208; NGC 2237, 208. Planetary — M27, 191; M57, 59, 77; NGC 2438, 128; NGC 7027, 126

Novae and supernovae: Nova 1245 was Mars, 219; Nova Carinae 1970, 216

Observatories: Capilla Peak, N. M., 19; Corralitos, N. M., 20; Itapetinga, Brazil, 144; Kitt Peak, Ariz., 10; Los Alamos, N. M., 21; National Radio Astronomy, 21; New Mexico Tech, 20; Sacramento Peak, N. M., 22; Sutherland, South Africa, 347; Tortugas Mountain, N. M., 20

Observatories, amateur: Beaver Island, Mich., 297; Eagle Pass, Tex., 250; Hermanus, South Africa, 363; Tucson, Ariz., 51; Waco, Tex., 252; Windsor, New South Wales, 219

Occultation: Pleiades February 10-11, 1973, 256

Personal notes: E. Achelis, 214; M. Bell, 166; I. Bowen, 212; R. Cameron, 158; A. Carter, 166; L. Farrar, 28; C. Hellman, 278; A. Hustead, 166; M. Kamienski, 358; E. Öpik, 278; C. Peters, 90, 152, 271, 339; R. Putnam, 23; C. Stearns, 23; J. Tebbutt, 219; H. Urey, 358; G. van Albada, 160

Photography: cooled emulsion, 189; exposure times for planets, 127; lunar crescent, 403; solar eclipse, 322; with Ektachrome Infrared, 397

Pluto: rotation, 277

Pulsars: gamma rays from, 155

Quasars: largest red shift, 353

Radio astronomy: amateur, 363, 392; Brazilian telescope, 144; OJ 287 and BL Lacertae, 224; solar flare detector, 392; very large array, 21

Rocket astronomy: 220

Saturn: Iapetus, 22; radar contact, 214

Sky atlases: Canterbury, 215; southern, 346

Solar system: Planet X? 22

Space (see Artificial satellites and spacecraft)

Stars: diameters of red, 91; early evolution, 279, 359; nearby, 354; nomenclature, 292; Pleione's shell, 216; spectra of rapidly rotating, 226; strange, in Aquila, 277; ultraviolet observations from orbit, 85

Sun: filters, 128; flare detector, 392; OSO-7 observations, 4; prominences, 124; recent sunspots, 61; spotless, 123

Telescopes and telescope making: arc lamp for testing, 183; caustic tester, 315; light-emitting diodes, 319; limiting magnitudes, 401; motor-driven eyepiece focuser, 120; moving a 16-inch, 250; traveler's mounting, 325; 12-inch Cassegrain dual-power, 116; 12½-inch Newtonian-Cassegrain, 389; 16-inch Newtonian, 189; 20½-inch Hindle, 219; 48-inch Anglo-Australian Schmidt, 159; 158-inch Kitt Peak, 10

Variable stars: OJ 287, 224; X Cancri, 91; AD Cassiopeiae, 122; BL Lacertae, 224; VV 452 Lacertae, 160; R Leonis, 92; β Persei, 131; T Tauri, 280; BU Tauri (Pleione), 216; DF Tauri, 281; VV Ursae Majoris, 262

X-ray astronomy: sources, 220

Sky and TELESCOPE

INDEX to Volume 46

July to December, 1973

Titles

Airborne Studies of the African Eclipse, *Arthur N. Cox* and *Donald H. Liebenberg*, 222
Amateurs Convene in Nebraska, *D. Milon*, 229
Another Skylab Success, *Raymond N. Watts, Jr.*, 301
Astronomy in Mongolia, *Krzysztof Ziolkowski*, 368
Comet Kohoutek News, 285
Comet Kohoutek — Prospects and Plans, 91 (correction, 355)
Early Evolution of Stars — I, The, *S. E. Strom* and *K. M. Strom*, May, 1973; correction to, 90
Eclipse Views, 218
First 4-Meter Photographs from Kitt Peak, 10
First Skylab Mission Proves Successful, *Raymond N. Watts, Jr.*, 74
French Eclipse Studies, *S. Koutchmy*, 215
Getting Ready for Comet Kohoutek, 207
Great Solar Eclipse, The, 147
High Altitude Observatory Eclipse Portrait, *Joseph H. Rush*, 217
High-Resolution Mars Albedo Maps, *Gerard de Vaucouleurs*, 141
Historic Refractor's 100th Anniversary, A, *R. W. Rhynsburger*, 208
International Copernican Celebrations in Poland, *Owen Gingerich*, 371
International Ultraviolet Explorer Satellite, The, *Anne B. Underhill*, 377
Interpreting Early-Type Stellar Spectra, *Dimitri Mihalas*, 79
Joint Japanese Expedition to Mauritania, *M. Kanno*, 220
June, 1974, Total Solar Eclipse, The, *Robert G. Roosen, Patrick H. Verdone*, and *Archie Jackson*, 295
Long Eclipse Is Widely Observed, The, 72
Lunar Crater Linné, The, *Richard J. Pike*, 364
Mariner 9 Picture Differencing at Stanford, *L. Quam, R. Tucker, B. Eross, J. Veverka*, and *Carl Sagan*, 84
More High-Speed Photometry of Cataclysmic Variables, *Brian Warner*, 298
New Problems in Astrometry, *Bart J. Bok*, 291
Notes on the Fourth Lunar Science Conference, *Thornton L. Page*, II, 14; III, 88
November Transit of Mercury, The, 227
Observer of Stellar Spectra, 3
Optical Fabrication Techniques for the MMT, *G. M. Sanger* and *R. R. Shannon*, 280
Plans for Mars Landings, *Raymond N. Watts, Jr.*, 159
Radio Emissions from Solar Flares, *Alan Maxwell*, 4
Recovery of Apollo, The, *Brian G. Marsden*, 155
Ring Eclipse in the Tropics, A, 225
SAO's Mount Hopkins Observatory Grows, 279
Skylab's Troubled Flight, *Raymond N. Watts, Jr.*, 22
Some Current Problems Concerning Galaxies, *John B. Irwin*, 287
Stony Ridge Observatory After 10 Years, *Dennis Milon*, 19
3.6-Meter Reflector for Hawaii, The, 306
Violent Changes in Comet 1973b, 144
Walden Pond Evenings, 71
World's Astronomers Meet in Australia, *John B. Irwin* and *Joseph Ashbrook*, 356
X-Ray Studies of the Crab Nebula Occultations, 1974-75, *T. M. Palmieri*, 160

Authors

Ashbrook, Joseph, Astronomical Scrapbook, 27, 163, 300
book review, 246
Variable Star Observers Hold Annual Meeting, 380
see also *Irwin, John B.*
Austin, Rodney R. D., letter, 139
Babott, F., see *Clark, T. A.*
Bishop, Carl R., Jr., A Driven Pointer for Setting Circles, 120
Bok, Bart J., New Problems in Astrometry, 291
Burlaga, Leonard F., book review, 321
Capen, Charles F., The Planet Mars in 1973, 53
Clark, T. A., and *F. Babott*, The Zodiacal Light Observed from Latitude 52° North, 130
Coombs, A. E., letter, 286
Cox, Arthur N., and *Donald H. Liebenberg*, Airborne Studies of the African Eclipse, 222
Cox, Robert E., book review, 247
conductor, Gleanings for ATM's, 46, 117, 184, 254, 329, 405
Temperature Effects on Mirror Cells, 256
Custer, Clarence P., Photographic Polar Alignment of an Equatorial Mounting, 329
de Azevedo, Rubens, letter, 286
Denlinger, Wendell H., A Leveling Device for Portable Telescopes, 122
de Vaucouleurs, Gerard, High-Resolution Mars Albedo Maps, 141
Dickinson, Dale F., book review, 111
Dunham, David W., December Occultation of Saturn, 419
This Month's Occultation of Saturn, 269
Duruy, M., letter, 95
Eddy, John A., book review, 39
Eross, B., see *Quam, L.*
Federer, C. Anthony, letter, 95
Frerichs, Denni, Bay Area Amateurs Hold Convention at Berkeley, 381
Gingerich, Owen, International Copernican Celebrations in Poland, 371
letter, 286
Green, Louis C., book review, 319
Hack, Margherita, book review, 40
Hawkins, Gerald S., book review, 175
Holmes, Clifford, Riverside Convention Instruments Pictorial, 29
Houston, Walter Scott, Deep-Sky Wonders, 62, 196, 265, 342, 415
Irwin, John B., Some Current Problems Concerning Galaxies, 287
Irwin, John B., and *Joseph Ashbrook*, World's Astronomers Meet in Australia, 356
J. A., see *Ashbrook, Joseph*
Jackson, Archie, see *Roosen, Robert G.*
Kanno, M., Joint Japanese Expedition to Mauritania, 220
Kieffaber, Lois, see *Peterson, Alan W.*
Kohman, Truman P., book review, 396
Koutchmy, S., French Eclipse Studies, 215
Liebenberg, Donald H., see *Cox, Arthur N.*
Lovi, George, Rambling Through . . . (current month) Skies, 34, 102, 170, 240, 314, 386
Maag, Russell C., Building a Recorder for Sudden Enhancement of Atmospherics, June, 1973; correction to, 122
Macdonald, Norman J., book review, 177
Mahon, Laurence F., Construction of a Blink Comparator, 254
Mallas, John H., book review, 251
Marsden, Brian G., The Recovery of Apollo, 155
Marvin, Ursula B., book review, 398
Maxwell, Alan, Radio Emissions from Solar Flares, 4
McLaughlin, W. Kenneth, Casting a Pitch Lap in a Mold, 46
Meeks, M. L., book review, 395
Meeus, Jean, letter, 286
Mihalas, Dimitri, Interpreting Early-Type Stellar Spectra, 79
Milon, Dennis, Amateurs Convene in Nebraska, 229
Stony Ridge Observatory After 10 Years, 19
Mitton, Simon, book review, 245
Morris, G. H., letter, 95
Morrison, Patric, Night Sky in Kenya, 414
Morrison, Philip, letter, 95

Olivier, Charles P., letter, 95
Page, Thornton L., book review, 43
Notes on the Fourth Lunar Science Conference — II, 14; III, 88
Palmieri, T. M., X-Ray Studies of the Crab Nebula Occultations, 1974-75, 160
Peterson, Alan W., and *Lois Kieffaber*, Photographing the Infrared Airglow, 337
Piini, Ernest W., A Three-Way Camera for Solar Eclipse Photography, 187
Pike, Richard J., The Lunar Crater Linné, 364
Quam, L., R. Tucker, B. Eross, J. Veverka, and *Carl Sagan*, Mariner 9 Picture Differencing at Stanford, 84
R. E. C., see *Cox, Robert E.*
Rahe, Jurgen, letter, 355
Rhynsburger, R. W., A Historic Refractor's 100th Anniversary, 208
Ricketts, Frederick, book review, 322
Ridpath, Ian, letter, 355
Rizzo, Patrick V., book review, 109
Roosen, Robert G., Patrick H. Verdone, and *Archie Jackson*, The June, 1974, Total Solar Eclipse, 295
Rush, Joseph H., High Altitude Observatory Eclipse Portrait, 217
Sagan, Carl, see *Quam, L.*
Sanger, G. M., and *R. R. Shannon*, Optical Fabrication Techniques for the MMT, 280
Shannon, R. R., see *Sanger, G. M.*
Sigler, Robert, Construction of a 10-inch Cassegrain, 117
Sinnott, Roger W., book review, 323
Notes from a Summer Weekend at Stellafane, 234
Strom, K. M., see *Strom, S. E.*
Strom, S. E., and *K. M. Strom*, The Early Evolution of Stars — I, May, 1973; correction to, 90
Strong, Paul S., Coronal Structures at the June 30th Eclipse, 261
Tucker, R., see *Quam, L.*
Underhill, Anne B., The International Ultraviolet Explorer Satellite, 377
Valleli, Paul A., The Focal Reducer as a Telescope Accessory, 405
van Raalten, J., A Dutch Clock Drive Made from Meccano Parts, 184
Verdone, Patrick H., see *Roosen, Robert G.*
Veverka, J., see *Quam, L.*
Victor, Robert C., Sun, Moon, and Planets This Month, 65, 133, 201, 273, 349, 421
Venus-Jupiter Configuration, 420
Vsekhsvyatsky, S. K., letter, 139
Walker, Capt. Ronald P., USAF, A Large Portable Knockdown Telescope, 49
Warner, Brian, More High-Speed Photometry of Cataclysmic Variables, 298
Warner, Deborah Jean, letter, 95
Watts, Raymond N., Jr., Another Skylab Success, 301
First Skylab Mission Proves Successful, 74
NASA Completes 15th Year, 303
Plans for Mars Landings, 159
Skylab's Troubled Flight, 22
Soviet Mission to Mars, 159
White, John, book review, 180
Whitney, Charles A., book review, 107
Wilcox, John M., book review, 176
Zekowski, Jeanne, Apollo Rendezvous in Ohio, 96
Ziolkowski, Krzysztof, Astronomy in Mongolia, 368

Departments and Features

Amateur Astronomers —
Amateur Briefs, 166, 236, 310, 382
Apollo Rendezvous in Ohio, 96
Bay Area Amateurs Hold Convention at Berkeley, 381
Convention News, 31, 98
Northwest Region Meets in Oregon, 165
Notes from a Summer Weekend at Stellafane, 234
Riverside Convention Instruments Pictorial, 29
Some Summer Conventions, 309
Variable Star Observers Hold Annual Meeting, 380
Astronomical Scrapbook —
Eagle Eye of William Rutter Dawes, The, 27
Navigation Near the North Pole, 163
Some Bunchings of Planets, 300
Books and the Sky —
Albert Einstein: Creator and Rebel, Banesh Hoffmann with the collaboration of Helen Dukas, 319
Annual Review of Astronomy and Astrophysics, Vol. 10, Leo Goldberg, David Layzer, and John G. Phillips, editors, 245
Astronomy, Colin A. Ronan, 109
Astronomy of Birr Castle, The, Patrick Moore, 323
Atoms and Molecules in Astrophysics, T. R. Carson and M. J. Roberts, editors, 111
Beyond Jupiter, Chesley Bonestell and Arthur C. Clarke, 180
Clouds of the World, Richard Scorer, 177
Coronal Expansion and Solar Wind, A. J. Hundhausen, 321
Cosmonauts in Orbit, Gene Gurney and Clare Gurney, 322
Dictionary of Scientific Biography, Vol. 7, Charles Coulston Gillispie, editor-in-chief, 246
Evolution of Radio Astronomy, The, J. S. Hey, 395
From Stonehenge to Modern Cosmology, Fred Hoyle, 175
Guideposts to the Stars, Leslie C. Peltier, 396
Handbook of the Constellations, Hans Vehrenberg and Dieter Blank, 251
Meteorites and Their Origins, G. J. H. McCall, 398
Milky Way, The, Stanley L. Jaki, 107
Optical Production Technology, D. F. Horne, 247
Origin of the Chemical Elements, The, R. J. Tayler, 40
Proceedings of the Third Lunar Science Conference, Elbert A. King, Jr., editor Vol. 1; Dieter Heymann, editor Vol. 2; and David R. Criswell, editor Vol. 3, 43
Science and Controversy, A. J. Meadows, 39
Space Physics and Space Astronomy, Michael D. Papagiannis, 176
Celestial Calendar —
Alinda's Closest Approach to the Earth, 417
December Occultation of Saturn, 419
December's Partial Lunar Eclipse, 346
Four Coming Meteor Showers, 64
Jupiter's Satellites, 65, 133, 201, 273, 349, 421
Meteors, 132, 347, 419
Minima of Algol, 64, 132, 200, 273, 348, 419
Moon Phases and Distances, 65, 132, 200, 272, 346, 420
Occultations of Europa by Io, 64, 200
Satellites Io and Europa in August, 132
Saturn Occultation, 347
Some Eclipses of Europa by Io and Ganymede, 200
Sun, Moon, and Planets This Month, The, 65, 133, 201, 273, 349, 421
This Month's Occultation of Saturn, 269
Two Fine Eclipses of Io by Ganymede, 347
Variable Star Maxima, 64, 132, 200, 272, 348, 418
Venus-Jupiter Configuration, 420
Front-cover photographs —
Australian Solar Observatory, 353
Eclipse in Mauritania, 137
Moon and Planets over Walden Pond, 69
Mount Hopkins Observatory, 277
Stony Ridge Observatory in California, 1
U. S. Naval Observatory's 26-inch Refractor, 205
Gleanings for ATM's —
Building a Recorder for Sudden Enhancement of Atmospherics, June, 1973; correction to, 122
Casting a Pitch Lap in a Mold, 46
Construction of a Blink Comparator, 254
Construction of a 10-inch Cassegrain, 117
Driven Pointer for Setting Circles, A, 120
Dutch Clock Drive Made from Meccano Parts, A, 184
Focal Reducer as a Telescope Accessory, The, 405
Large Portable Knockdown Telescope, A, 49
Leveling Device for Portable Telescopes, A, 122
Observatory Built for Norman Lockyer Refractor, 259
Photographic Polar Alignment of an Equatorial Mounting, 329
Temperature Effects on Mirror Cells, 256
Three-Way Camera for Solar Eclipse Photography, A, 187
In the Current Journals, 26, 94, 146, 228, 305, 367
Letters, 95, 139, 286, 355
New Books Received, 44, 114, 181, 252, 325, 400
News Notes —
Aids for Teachers, 94
Astronomical Coincidence, An, 26
Center for Astrophysics, 26
Chemistry of Titan, 367
Comet of the Perseid Meteors, The, 367
Constancy of the Zodiacal Light, 304
Distance of the Hyades, 145
Earliest Life, 145
Evolution of the Asteroids, 367
Far-Side Lunar Basin, 145
Galaxy Erupts, A, 367
Gamma-Ray Bursts from Deep Space, 146
How Old Is the Crater Copernicus? 366
Interstellar Sulfur Monoxide, 366
Io's Polar Caps, 228
Is Barnard's Star Single? 94
Lunar-Terminator Phenomenon, 146
Lyman Spitzer Honored, 146
Meteorite Crater in India, 26
Moon Rock Expert, 9
More About Comet 1973b, 304
Mountaintop Telescope in Colorado, 94
Moving a 40-inch Telescope, 146
New Society in India, 26
Nicolaus Copernicus Heritage, 145
Pulsating Stars and Helium Abundance, 145
Radio Detection of a Giant Dust Cloud, 26

Radio Flare Star, 367
Rapid Changes in Gamma² Velorum, 228
Search for Optical Pulsars, A, 228
Shakhbazian I, 305
Soyuz 12 Mission, The, 379
Trumpler Award, 28
Whipple Honored, 366
Observer's Page —
Amateur Observations of the Skylab Procession, 126
Another Potpourri from the Observers' Notebook, 412
Coronal Structures at the June 30th Eclipse, 261
Deep-Sky Wonders, 62, 196, 265, 342, 415
Green Flash of Venus, 413
News of Comet Kohoutek, 416
Night Sky in Kenya, 414
Notes on Some Summer Meteor Showers, 340
Observers' Notebook, 61, 198, 264, 344
Occultation Supplement, 343, 416
Partial Eclipse Notes, 194
Photographic Guide to Mars, A, 266
Photographing the Infrared Airglow, 337
Planet Mars in 1973, The, 53
Saturn: A Photographic Roundup, 124
Some Solar Eclipse Highlights, 190
Sunspot Numbers, 61, 131, 197, 267, 343, 416
Zodiacal Light Observed from Latitude 52° North, The, 130
Rambling Through . . . (current month) Skies, 34, 102, 170, 240, 314, 386
Southern Stars, 37, 173, 317
Stars for . . . (current month), 34, 102, 170, 240, 314, 386

Selected Topics and Celestial Objects

This listing is not intended to be exhaustive and does not supplant the other parts of the index. For example, material in such regular features as Books and the Sky is ordinarily indexed only under the Departments and Features section.

Airglow: 337
Amateur astronomers: AAVSO, 380; Berkeley, Calif., 381; Dayton, Ohio, 96; Jacksonville, Fla., 309; Junior Astronomical Society, England, 355; Kalamazoo, Mich., 309; Omaha, Neb., 229; Portland, Ore., 165; Riverside, Calif., 29; Springfield, Vt., 234; Toledo, Ohio, 309
Artificial satellites and spacecraft: Mariner 9, 84; NASA's 15 years, 303; reentry observed, 412; Skylab, 22, 74, 126, 301; Soyuz 12, 379; Ultraviolet Explorer, 377; Vela, 146; Viking, 159
Asteroids: Alinda, 417; Apollo, 155; evolution, 366
Clusters: Globular — M5, 62; NGC 6535, 62. Open — Collinder 463, 198; Hyades, 145; M47, 79; NGC 1502, 415; NGC 2362, 79; NGC 6791, 197; NGC 6811, 197; NGC 6819, 197; NGC 6866, 197; NGC 7044, 265; NGC 7062, 265; NGC 7086, 265; NGC 7128, 265; IC 4756, 62
Comets: orbit shapes, 386; origin of, 139; 1970 II (Bennett), 355; 1973b (Tuttle-Giacobini-Kresak), 144, 304; 1973f (Kohoutek), 91, 207, 285, 416
Conjunctions: rare planetary groupings, 300
Constellation study: light shield for, 198; Pavo, 170; precession, 314; Sagittarius, 102; southern, 414
Copernicus: 145, 286, 371
Double and multiple stars: Alpha Comae, 95; Delta Cygni, 286; Sirius, 344
Eclipses: June 30, 1973, solar, 72, 147, 187, 190, 194, 215, 217, 218, 220, 222, 261, 410; December 24, 1973, solar, 225; June 20, 1974, solar, 286, 295; October 23, 1976, solar, 286
Galaxies: Canberra symposium, 287; cluster Shakhbazian I, 305; Coma cluster, 13; Large Magellanic Cloud, 88; spiral arms seen, 61, 344; Stephan's Quintet, 289; M51, 12, 20; M74, 342; M101, 288; NGC 470, 343; NGC 474, 343; NGC 524, 343; NGC 1265, 290; NGC 2276, 415; NGC 2300, 415; NGC 2403, 415; NGC 2655, 415; NGC 5548, 367; NGC 5866, 13; NGC 7541, 343; IC 2233, 287
Gamma-ray astronomy: 146
History: Copernicus, 145, 286, 371; W. Dawes, 27; moon photographed with Herschel telescope, 95; NASA, 303; polar controversy, 163; J. Gomes de Souza, 286; star nomenclature, 95; 26-inch refractor, 208
International Astronomical Union: 287, 291, 356, 371
Jupiter: satellites, 200, 228
Life: earliest, 145
Mars: future missions to, 159; high-resolution maps, 141; in 1973, 53; Mariner 9 pictures, 84; photographs, 266
Mercury: November 10, 1973, transit, 227
Meteorites: crater in India, 26
Meteors: meteoroid sizes, 89; summer, 340
Milky Way galaxy: dust cloud, 26; interstellar sulfur monoxide, 366
Moon: Apollo results, 14, 88; Copernicus, 366; earthshine, 344; far-side basin, 145; Linné, 364; Mare Imbrium, 16, 18; Mare Smythii, 14; Mare Tranquillitatis, 15; Messier and Messier A, 232; terminator glow, 146; young crescent, 139
Nebulae: Diffuse — Crab, 160; M8, 10; M17, 12; M20, 20; M42, 334. Planetary — IC 3568, 415; IC 4593, 62
Observatories: Center for Astrophysics, 26; Creighton, 230; Culgoora, 5, 361; Molonglo, 363; Mount Evans, 94; Mount Hopkins, 279; Mount Stromlo, 360; Narrabri, 362; Parkes, 362; Siding Spring, 360; Torun, 375; Ulan Bator, 368; U. S. Naval, 208
Observatories, amateur: Exeter, England, 259; Stony Ridge, Calif., 19
Personal Notes: I. Bowen, 95; W. Dawes, 27; P. Gast, 9; A. Joy, 3; L. Spitzer, 146; F. Whipple, 366
Photography: blink comparator, 254; eclipse camera, 187; focusing a reflex camera, 61; solar booklet, 412
Planetariums: 240
Professional societies: Indian, 26
Pulsars: 228
Saturn: recent photographs, 124; Titan, 367
Radio astronomy: in Australia, 361; flare star, 367
Space (see Artificial satellites and spacecraft)
Stars: astrometry, 291; Barnard's star single?, 94; early-type spectra, 79; Gamma² Velorum, 228; helium abundance, 145
Sun: radio emission from flares, 4; Skylab photographs, 25, 76
Supernovae: in NGC 4975 and in NGC 4981, 26
Telescopes and telescope making: aligning an equatorial, 329; blink comparator, 254; casting pitch laps, 46; driven pointer for setting circles, 120; eclipse camera, 187; focal reducer, 405; leveling device for equatorials, 122; Meccano drive, 184; mirror cells, 256; moving a 40-inch, 146; multiple-mirror, 280; Riverside fair, 29; Stellafane convention, 234; 10-inch Cassegrain, 117; 12½-inch knockdown, 49; 26-inch refractor, 208; 30-inch Stony Ridge, 19; 144-inch Hawaiian, 306; 158-inch Kitt Peak, 10
Variable stars: cataclysmic, 298; charts, 344; R Aquilae, 367; Z Chamaeleontis, 298; U Geminorum, 298; VW Hydri, 299
Venus: green flash of, 413
X-ray astronomy: Crab nebula, 160
Zodiacal light: 130, 304